



30 SMUTS DRIVE  
HALFWAY GARDENS  
P O BOX 5260, HALFWAY HOUSE, 1685

TEL +27 (0)11 805 1940  
FAX +27 (0)11 805 7010  
e-mail [mail@airshed.co.za](mailto:mail@airshed.co.za)

21 August 2008

## INGULA PUMPED-STORAGE SCHEME BRIDGE UPGRADE QUALITATIVE AIR QUALITY ASSESSMENT

### 1. Introduction

Eskom proposes to construct the Ingula Pumped-Storage Scheme (PSS) near Van Reenen in Kwa-Zulu Natal, with the purpose of generating additional electricity to feed into the national grid. The Ingula PSS comprises of two reservoirs, underground powerhouse complex, waterway tunnels, and access road and transmission lines. As part of this project, a low water bridge located approximately 2 km downstream from the lower reservoir, needs to be upgraded.

The bridge provides the crossing over the Braamhoekspruit for a gravel road used primarily by local residents. The area surrounding the bridge comprises of farm land used primarily for grazing and subsistence farming. A small rural farmstead is located 100m from the Ingula Bridge.

Airshed Planning Professionals (Pty) Ltd was contracted to assess the possible impacts this upgrade will have on the surrounding environment and human health.

### 3. Sources of Emissions from the Ingula Bridge upgrade

The gravel road crossing over the Ingula Bridge is an existing source of emissions. Based on the project description it is understood that the only change on this road would be a nominal increase in vehicles utilising the road (only a few additional vehicles). The upgrade of the bridge will in itself not result in any increases in emissions. The construction of the bridge during upgrade will also be a source of emissions.

Particulate emissions are the main concern from unpaved roads surfaces with the amount of gaseous emissions resulting from vehicle tailpipes being far less and therefore not as significant in terms of impacts.

Vehicle entrained dust from unpaved road surfaces typically result in impacts near to the road, depleting rapidly away from the road edge. Fugitive dust is generated when the force of the wheels of vehicles travelling on unpaved roadways causes pulverisation of surface material. Particles are lifted and dropped from the rotating wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to affect the road surface once the vehicle has passed. The quantity of dust emissions from unpaved roads varies linearly with the volume of traffic. In addition to traffic volumes, emissions also depend on a number of parameters which characterise the condition of a particular road and the associated vehicle traffic, including average vehicle speed, mean vehicle weight, average number of wheels per vehicle, road surface texture, and road surface moisture (EPA, 1998b).

The construction phase will primarily comprise of land clearing and topsoil removal for new structures to be erected. This includes the areas for the storage piles and the occasional drilling and blasting. Vehicle-entrainment of dust from construction site represents the most significant source of fugitive dust emissions during this phase.

#### **4. Conclusions and Recommendations**

- The main source of atmospheric emissions from the Ingula Bridge project is therefore fugitive dust resulting from the gravel road surface. Given the marginal increase in traffic on the road, and the infrequent use of the road, it is regarded not to be a significant source of atmospheric emissions. The expected impacts from the proposed Ingula Bridge upgrade are regarded to be of low significance.
- Construction of the bridge (typically including drilling and blasting) and is a potentially a significant source of fugitive dust for the duration of the construction phase. The construction phase is however temporary hence reducing the significance of the potential impacts on the surrounding environment.

##### **4.1 Recommendations**

- It is recommended that that during Construction phase, use will be made of water sprays at all dust generating activities, including drilling and grading. Blasting is difficult to mitigate but it is expected to only occur for a few times and very short durations.
- Once the Ungula Bridge is in operation, a speed limit should be placed near to the bridge to attempt a reduction in emissions resulting from vehicles utilising the road. .

---



**H Liebenberg Enslin**  
**Director**